GRINBERG, A.A.

SOV/62-58-8-22/22

AUTHOR: None Given

TITLE: The General Meeting of the Department of Chemical Sciences of the AS USSR From April 24 to 25, 1958 (Obshcheye sobraniye otdeleniya khimicheskikh nauk AN SSSR ot 24-25 aprelya 1958 g.)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 8, pp. 1017 - 1018 (USSR)

ABSTRACT: At this General Meeting the following scientists delivered lectures: The Corresponding Members, Academy of Sciences, USSR, A. A. Grinberg, I. A. Kazarnovskiy, A. D. Petrov, and R. Kh. Freydlina, Doctor of Chemical Sciences. A. A. Grinberg reported on the new knowledge on the kinetics and the mechanism of the reactions of the exchange and the substitution in complex compounds of platinum. Based on experimental data the lecturer concluded that in the process of the isotopic exchange in the derivatives of bivalent palladium the dissociation and association mechanism play an important role. These explanations raised a vivid discussion in which mainly I. I.Chernyayev,Member, Academy of Sciences, USSR and the Corresponding Members, Academy of Sciences, USSR V. I. Spitsin, Ya. K. Syrkin, I. V. Tananayev, and A. D. Gelman, Doctor of Chemical Sciences took part. I. A.

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The General Meeting of the Department of Chemical Sciences of the AS USSR
From April 24 to 25, 1958

Kazarnovskiy held a lecture on the investigations of the
kinetics and the mechanism of the arbitrary decomposition
of potassium ozonide (employing the magnetic method) carried
out by himself and his collaborators (S. I. Reykhshteyn and
L. N. Bykova, Candidates of Chemical Sciences). A. D. Petrov
on behalf of the collaborators of the Institute of Organic
Chemistry (V. F. Mironov, V. A. Ponomarenko, S. I. Sadykh-Zade
and Ye.A. Chernyshev) reported on "The Synthesis of New Forms
of Silicon Containing Monomers". He announced new results of
investigations of the catalytic binding of hydride silanes
with unsaturated and aromatic compounds not published up to
now. In the discussion following this lecture V. V. Korshak,
Corresponding Member, Academy of Sciences, USSR, said that the
results obtained by the team of A. D. Petrov were of great
importance. The corresponding conclusions had to be drawn from
the influence exerted by silicon in the various groups on the
reactivity of these compounds. The report delivered by R. Kh.
Freydlina on "The Homolytic Isomerization in Solutions" raised
great interest. This lecture was followed by a vivid exchange

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SOV/62-58-8 22/22

The General Meeting of the Department of Chemical Sciences of the AS USSR
From April 24 to 25, 1958

of opinions in which mainly the following Members, Academy
of Sciences, USSR took part: I. L. Knunyants A. N. Nesmeyanov,
and N. N. Semenov, as well as the Corresponding Members, Academy
of Sciences, USSR V. V. Nekrasov, Ya.K. Syrkin and A. D. Petrov.
I. L. Knunyants said that the work carried out by R. Kh.
Freydlina on the homolytic isomerization in solutions represented
an important event in organic chemistry.

Card 3/3

IN'KOVA, Ye.N.; GRINBERG, A.A.

Reduction of platinum occurring in the course of the synthesis of
hexamine. Trudy LTI no.46:17-20 '58.   (MIRA 14:4)
          (Platinum)   (Diphenylamine)

GRINBERG, A.A.

"Mutual Interaction of Platinum Complexes."

a paper presented the London International Conference on Coordination
Chemistry   London, 6-11   apr '59

SO: B-3,129,763   8 May '59

GRINBERG, A.A.; SHAGISULTANOVA, G.A.

Investigating the kinetics of bromine isotope exchange in potassium platinum tribromotriamine. Radiokhimiia 1 no.1:91-102 '59.
(MIRA 12:4)

(Bromine—Isotopes)   (Platinum compounds)

GRINBERG, A.A.; IN'KOVA, Ye.N.

Exchange of ethylamine in the system $[Pt(CH_3CH_2NH_2)_4]SO_4 - 4CH_3C^{14}H_2$ NH_2. Radiokhimiia 1 no.1:103-104 '59. (MIRA 12:4)
(Platinum compounds) (Carbon—Isotopes)
(Ethylamine)

GRINBERG, A.A.; PETRZHAK, G.I.; YEVTEYEV, L.I.

Preparation and properties of uranium oxalic acid salts of rare earth elements. Radiokhimiia 1 no.3:300-308 '59.   (MIRA 12:10)

(Oxalic acid) (Oxalatouranates)

SOV/78-4-1-16/48

5(2)
AUTHORS: Grinberg, A. A., Itskovich, T. B., Troitskaya, A. D.

TITLE: On the Question of the Structure of Phosphorous Acid and Its
              Derivatives (K voprosu o stroyenii fosforistoy kisloty i yeye
              proizvodnykh)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 1, pp 79-81
   (USSR)

ABSTRACT: The reciprocal effect between an aqueous solution of potassium
              chloroplatinate, trimethyl phosphite and dimethyl phosphorous
              acid was investigated. The experimental data on the saponi-
              fication process of dimethyl phosphorous acid and its complexes
              were found by measuring the change of the pH value. Equal con-
              centrations of aqueous solutions of dimethyl phosphorous acid
              and $[Pt\{P(OCH_3)_2OH\}_2 \{P(OCH_3)_2O\}_2]$ were heated in a water
              bath at 100°. After a certain time the pH value was measured
              at 20° in order to find out the difference of saponification
              between free dimethyl phosphorous acid and the acid co-
              ordinatively bound with bivalent platinum as an addendum. It
Card 1/2   is evident from the change of the pH value on heating that

SOV/78-4-1-16/48

On the Question of the Structure of Phosphorous Acid and Its Derivatives

free dimethyl phosphorous acid saponifies quicker during the first 15 minutes with a considerable reduction of the pH value of the solution. The saponification of group $P(OCH_3)_2OH$ in the complex $\left[Pt\left\{P(OCH_3)_2OH\right\}_2\left\{P(OCH_3)_2O\right\}_2\right]$ is insignificant. The qualitative and quantitative determination of the final products of the platinum complex saponification showed platinum, phosphorous and phosphoric acid. The saponification process is described as follows:

$$\left[Pt\left\{P(OH)_3\right\}_2\left\{P(OH)_2O\right\}_2\right] + HOH \longrightarrow Pt + 3\ H_3PO_3 + H_3PO_4$$
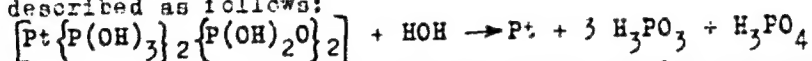
The experiments prove that in platinum complex compounds the addenda of dimethyl phosphorous acids and phosphorous acid contain trivalent phosphorus. There are 1 figure, 2 tables, and 9 references, 7 of which are Soviet.

SUBMITTED: October 26, 1957

Card 2/2

5(2)
AUTHORS: Grinberg, A. A., Chapurskiy, I. N.

TITLE: Acetyl Acetonates of Bivalent Platinum (Atsetilatsetonaty dvukhvalentnoy platin.)

ABSTRACT: The orange and light yellow acetyl acetonates of bivalent platinum, which are soluble in water, and the can.ry-yellow acetyl acetonates, which are insoluble in water, were investigated with regard to their production conditions and physico-chemical properties. The orange salt is easily soluble in water ($\sim$4.73% at 15°), difficultly soluble in alcohol and practically insoluble in ether, chloroform, and benzene. The formula by Werner was proved by the analyses of this salt (Ref 3). On account of the determination of the molecular electric conductivity the following coordination formula has been suggested for the orange salt:

$$K \begin{bmatrix} Cl \\ Cl \end{bmatrix} Pt \ Ac \qquad Ac = \begin{bmatrix} CH_3-CO-CH=CO-CH_3 \end{bmatrix}$$
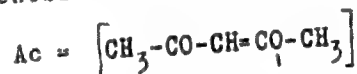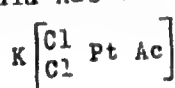
Card 1/3

Acetyl Acetonates of Bivalent Platinum

The formula of the light yellow salt is: $K\begin{bmatrix} Cl \\ Ac \end{bmatrix} Pt\ Ac$

The light yellow salt is also easily soluble in water and difficultly soluble in alcohol. The solubility in water is ~10.2%. If hydrochloric acid is added, an amorphous yellow precipitate separates out of the aqueous solutions of this salt. It is difficultly soluble in water and easily soluble in organic solvents. The canary-yellow acetyl acetonate is insoluble in water but easily soluble in organic solvents, as benzene, alcohol, chloroform, and carbon tetrachloride. By analyzing this compound the following formula was found: $Pt(C_5H_7O_2)_2$. The molecular weight of this compound is 388 (calculated 393.34). The solubility determination of $Pt(C_5H_7O_2)_2$ in benzene and alcohol at 25^0 showed the following results: L_{25c} in ethyl alcohol $= 6.5 \cdot 10^{-3}$ g-mol/l, L_{250} in benzene $= 4 \cdot 10^{-2}$ g-mol/l.

The determination of the molecular electric conductivity of the weak aqueous solutions shows that the yellow salt and the orange salt are binary electrolytes whereas the insoluble

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Acetyl Acetonates of Bivalent Platinum

SOV/78-4-2-11/40

platinum diacetyl acetonate is no electrolyte. There are
1 table and 4 references, 3 of which are Soviet.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut im. Lensoveta
(Leningrad Technological Institute imeni Lensovet)

SUBMITTED: November 3, 1957

Card 3/3

5(4)   SOV/78-4-2-12/40
AUTHORS: Grinberg, A. A., Kukushkin, Yu. N.

TITLE: On the Kinetics of the Interaction of Ammonia With Several
                  Salts of the Type $K_2[PtX_4]$ and $K[PtNH_3X_3]$ (O kinetike
                  vzaimodeystviya ammiaka s nekotorymi solyami tipa $K_2[PtX_4]$
                  i $K[PtNH_3X_3]$)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 2,
                  pp 319-324 (USSR)

ABSTRACT: The interaction of ammonia with the salts $K_2[PtCl_4]$,
                  $K[PtNH_3Cl_3]$, $K_2[PtBr_4]$, and $K[PtNH_3Br_3]$ was examined in
                  various concentrations and at various temperatures. It was
                  found that the reaction rate of the interaction depends on
                  the concentration of ammonia and the complex salts. The
                  kinetic data on the interactions in the systems
                  $K_2[PtCl_4]$-$2NH_3$ and $K[PtNH_3Cl_3]$-NH_3 are shown in tables 1 and 2.
                  The results show that the ammonia molecule in the complex
                  compound $K[PtNH_3X_3]$ (X=Cl, Br) considerably increases the
Card 1/2   mobility of the addenda which are in cis-position to ammonia.

SOV/78-4-2-12/40

On the Kinetics of the Interaction of Ammonia With Several Salts of the Type $K_2[PtX_4]$ and $K[PtNH_3X_3]$

This cis-influence of the ammonia molecule on the reactivity is stronger at the coordinate $Br-Pt^{II}-Br$ than in the chlorine system $Cl-Pt^{II}-Cl$. The activation energy in the system $K_2[PtBr_4]-2NH_3$ is somewhat higher than in the respective chlorine system. There are 4 figures, 5 tables, and 5 references, 3 of which are Soviet.

SUBMITTED: November 22, 1957

Card 2/2

SOV/78-4-5-13/46

5(4)
AUTHORS: Grinberg, A. A., Vrublevskaya, L. V., Gil'dengershel', Kh. I.,
            Stetsenko, A. I.

TITLE: New Data Concerning the Acid-basic Properties of Complex Compounds (Novyye dannyye po kislotno-osnovnym svoystvam kompleksnykh soyedineniy)

ABSTRACT: The present paper was submitted at the VII All-Union Conference on the Chemistry of Complex Compounds at Leningrad on October 11, 1956. The behavior of acid-basic complex compounds and the solvatation equilibria in aqueous solutions of ammoniacates and ammines of metal was investigated. The acid properties of the propylene-diammino-derivatives of quadrivalent platinum as well as the acid properties of cis-$Pt(NH_3)_4Cl_2$ were investigated. The cis-isomer of the propylene-diammine-derivative Pt^{4+} was for the first time synthetized. The acid properties of this compound were determined by
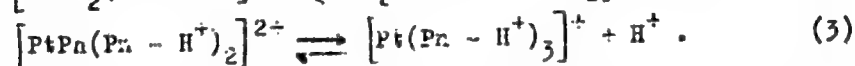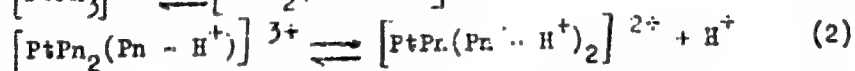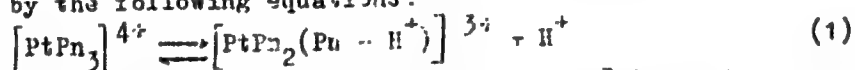
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SOV/78-4-5-43/46

New Data Concerning the Acid-basic Properties of Complex Compounds

potentiometric titration by means of the glass electrode.
Figure 1 shows the titration curve of $[PtPn_3]Cl_4$ with NaOH.
The process of the acid dissociation of $[PtPn_3]^{4+}$ is describ-
ed by the following equations:

$$[PtPn_3]^{4+} \rightleftharpoons [PtPn_2(Pn - H^+)]^{3+} + H^+ \tag{1}$$

$$[PtPn_2(Pn - H^+)]^{3+} \rightleftharpoons [PtPn(Pn - H^+)_2]^{2+} + H^+ \tag{2}$$

$$[PtPn(Pn - H^+)_2]^{2+} \rightleftharpoons [Pt(Pn - H^+)_3]^{+} + H^+ . \tag{3}$$

It was shown that the cis-isomer is a dibasic acid with the
following dissociation constants: $K_1 = 6.1 \cdot 10^{-9}$ and
$K_2 = 4.4 \cdot 10^{-11}$. The trans-isomer is a weak monobasic acid,
$K_1 = 1.8 \cdot 10^{-11}$. The potentiometric titration of the isomeric

Card 2/4   compound $[Pten_2Cl_2]Cl_2$ was investigated. The dissociation

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New Data Concerning the Acid-basic Properties of Complex Compounds

constants of this compound are the following: $K_1 = 4.3 \cdot 10^{-10}$ and $K_2 = 4.9 \cdot 10^{-11}$. The acid properties of the cis-isomers of the propylene-diammine-cyclo are more marked than those of the corresponding ammine derivatives. $[PtPn_3]Cl_4$ is a tri-basic acid. The constants of the stepwise dissociation are the following: $3.9 \cdot 10^{-6}$; $2.5 \cdot 10^{-10}$ and $2.1 \cdot 10^{-11}$. The acid properties of the following preparations were investigated: $[Co(NH_3)_6]Cl_3$, $[Coen_3]J_3$; $[Iren_3]J_3$; $[Rhen_3]J_3$. The titration curves of this compound are shown by figures 4 and 5. The causes of the cis-effect and of the acidity of the propylene-diammine-derivatives of quadrivalent platinum are discussed. On the basis of experimental data the stepwise dissociation of $Pt(Thio)_4(OH)_2$ (Thio = $SC(NH_2)_2$) is calculated. The constants K_1 and K_2 are approximately $10^{-5} - 10^{-6}$ and $10^{-9} - 10^{-10}$ respectively. There are 5 figures and 26 references, 11 of which are Soviet.

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SOV/78-4-7-2/44

5(2)
AUTHOR: Grinberg, A. A.

TITLE: On Research Work of Actual Interest in the Field of Inorganic
               Chemistry (Ob aktual'nykh napravleniyakh issledovaniy v
               oblasti neorganicheskoy khimii)

ABSTRACT: This lecture was delivered on September 8, 1958 at the Slovakian
               Academy of Sciences at Bratislava. As the most important field
               of research the author mentions: transuranium, the elements of
               rare earths and rare elements (yttrium, lanthanum, cerium,
               zirconium, niobium, molybdenum, ruthenium, etc. play a part in
               the chemistry of nuclear reactors, germanium, titanium, beryl-
               lium have become technically interesting, lithium, uranium,
               deuterium, and cadmium are also of importance for nuclear
               power engineering). Mention is further made of the intensi-
               fication of reactions by catalysis, works on "anomalous"
               valences, the investigation of complex compounds, development
               of the chemistry of complexons (on the basis of the works by
               Professor Přibyl et al.), the chemistry of internal complex

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On Research Work of Actual Interest in the Field of Inorganic Chemistry

salts, and synthesis and the application of specific ion ex-
changers. Mention is further made of the new development of the
chemistry of hydrides (Al-H-compounds, gallium-hydrogen com-
pounds). The chemistry of polymers is of importance also in in-
organic chemistry: aluminum silicates, metaphosphates. Further-
more, problems of the structure and the isomeric states of
simple and inorganic acids remain to be explained. The chemistry
of intermetallic compounds requires new fundamental bases for
the classification of accumulated data. N. S. Kurnakov dealt
with compounds of reciprocal composition. The investigation of
phases of varying composition, the mixed crystals and iso-
morphic mixtures belong to the field of general chemistry,
which are of importance for theoretical and applied radiation
chemistry, geochemistry, and crystallochemistry. Besides work
connected with the structure of solid phases, work concerning
non-aqueous solvents is of growing practical and theoretical
interest.

SUBMITTED: December 25, 1958

Card 2/2

5(2)
AUTHOR:

Grinberg, A. A.

TITLE: New Data on the Kinetics of Substitution Reactions and the
           Reciprocal Influence of Coordinated Groups (Novyye dannyye po
           kinetike reaktsiy zameshcheniya i po vzaimnomu vliyaniyu ko-
           ordinirovannykh grupp)

ABSTRACT: The author gives a survey of papers available so far, which
            deal with the trans-effect discovered by I. I. Chernyayev, and
            he gives the results obtained for the reactions of Pt^{II} and Pt^{IV}
            in tables 1 and 2. In collaboration with S. S. Borzakova,
            Ye. N. In'kova, N. V. Kiseleva, Yu. N. Kukushkin and G. A. Sha-
            gisultanova, compounds of the type K_2PtX_4 and K_2PdX_4 (X =
            halogen) were investigated kinetically, spectrometrically, and
            potentiometrically, and pH and electric conductivity were
            measured (Figs 1-4). Whereas the reactions in the platinum
            system are reversible, the palladium system undergoes irreversi-
            ble transformations (Fig 5), which lead to ions with a co-
Card 1/4   ordination number > 4, probably $PdCl_5^{3-}$ or $PdCl_6^{4-}$ (Figs 6,7).

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New Data on the Kinetics of Substitution Reactions and the Reciprocal Influence
of Coordinated Groups

Further, investigations were carried out of the kinetics of
the reactions of $K_2[PtCl_4]$, $K[PtNH_3Cl_3]$, $[Pt(NH_3)_3Cl]Cl$ and
$K_2[PtBr_4]$ with alkalis, of the same compounds and $K[PtPyCl_3]$,
$K[PtNH_3Br_3]$ (Py = pyridine) with ammonia, and of $K_2[PtCl_4]$,
$K[PtNH_3Cl_3]$ and $K[PtPyCl_3]$ with pyridine. The coefficients of
the rate of substitution reactions are given in table 3, the
kinetic characteristic values of the substitution reactions at
different temperatures by table 4. The author arrives at the
following conclusions: The previously found reverse ratio
between the thermodynamical stability of some compounds of Pt^{II}
and their kinetic lability applies also to reactions with water
and ammonia. To the thermodynamical characteristic values and
the instability constant it is necessary to add kinetic charac-
teristic values as e.g. the velocity (or half-life period) of
the establishment of the solution equilibrium. On the basis of
the new data on the exchange of substituents in symmetric com-
plexes of Pt^{II}, which contain thiourea or ethylamine, a rapid

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New Data on the Kinetics of Substitution Reactions and the Reciprocal Influence of Coordinated Groups

reaction rate of the Pt^{II}-compounds with such substituents as tertiary phosphines, esters of phosphoric acid, and thio-esters may be assumed to develop according to the parallelism existing between the exchange velocity of the addend and the trans-effect. The data obtained for the reactions with NH_3 and pyridine indicate the existence of an intermolecular cis-effect, which manifests itself by increased mobility and reactivity of the halogen atoms, which are in cis-position with respect to NH_3 of Py. The author sets up the following hypothesis in this connection: If the interior range contains several groups pre-tending to a reaction with the free valence electrons of Pt^{II}, the degree of the reaction of each of these groups becomes lower than if such neighboring groups are lacking. On the other hand, the existence of such groups which show no or only little reaction with the valence electrons of Pt^{II}, must increase the trans-effect of the addends. The cis-affects thus manifest them-selves by an increase or attenuation of the trans-effects. The influence of light upon the reactions observed by other authors (Refs 29,39,40,41) must be further investigated for various wave lengths and by the use of catalysts. On the basis of the

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SOV/78-4-7-10/44

New Data on the Kinetics of Substitution Reactions and the Reciprocal Influence
of Coordinated Groups

> papers of references 43 and 44 the possibilities of trans-
> effects must be investigated also in the complex compounds of
> other metals (as e.g. cobalt). There are 11 figures, 4 tables,
> and 44 references, 27 of which are Soviet.

SUBMITTED: December 26, 1958

Card 4/4

GRINBERG, A.

New information on the kinetics of substitution reactions and the
mutual effect of the coordinated groups. Tr. from the Russians. p. 201.

CHEMICKE ZVESTI. Bratislava, Czechoslovakia. Vol. 13, No. 4, Apr. 1959.

Monthly list of East European Accessions (EEAI) LC, Vol. 9 No. 10
Oct. 1959.
Uncl.

S/186/(0/002/001/013/022
A057/A129

AUTHORS: Grinberg, A.A.; Trofimov, A.M.; Stepanova, L.N.

TITLE: Determination of the charge of polynuclear complex ruthenium ions by
            the ion-exchange method

PERIODICAL: Radiokhimiya, v. 2, no. 1, 1960, 78 - 82

TEXT: The present investigation was carried out after a visit of one of
the present authors in the laboratory of J.M. Fletcher in Harwell (England) in
connection with some new data (reported by Fletcher et al. at the International
Conference on Coordination Chemistry, London, May 6, 1959, under the title: bi-
nuclear chloro and other polynuclear complexes of ruthenium) concerning ruthenium
complexes. In the discussion the investigators stated the importance of direct
determination of the charge of the red polynuclear ruthenium cation, for which
the British chemists assumed a charge of +6. Definite solution of this question
was of interest apart from the verification of data obtained by Fletcher et al.,
because complex anions with charges greater than four are rare. F.M. Jaeger and
P. Koets [Ref. 3: Z. anorg. Ch., 170, 347 (1928)] reported about nine-valent ca-
tions, but their existence is at present in question [J.C. Bailar, Ref. 4: Chem-

Card 1/5

Determination of the charge of polynuclear....

istry of the Coordination Compounds, 65, N.Y. (1956)]. Hence it was important to discover a method to determine the charge of highly-charged cations. Thus the present authors investigated the applicability of the recently published ion-exchange method [A.V. Trofimov and L.N. Stepanova, Ref. 2: Radiokhimiya, 1, 4, 403 (1959)] to the determination of the charge of the red polynuclear ruthenium cation. In further investigations this method will be applied to check data obtained by Jaeger and Koets. In the present experiments a sample of the ruthenium complex synthesized by Fletcher et al. was used. The principle of the ion-exchange method consists in the determination of the distribution coefficient α of radioisotopes on two ion-exchange resins with different swelling capacities. According to the rules of ion-exchange:

$$\lg \frac{a^I}{a^{II}} = \frac{z_1}{z_2} \lg \frac{C^I}{C^{II}} + \frac{z_1 - z_2}{z_2} \lg \frac{v^{II}}{v^I} \qquad (1)$$

I and II refer to the resins with two swelling capacities, z_1 – effective charge of the investigated ions; z_2 – charge of the exchanged ions, C^I and C^{II} equivalent exchange capacity of the resins (per 1 g of dry resin), v^I and v^{II} – specific volumes of swollen resins under the conditions of the distribution coefficient determination. In the exchange of mono-valent ions (H^+, Na^+ etc.), the charge can be calculated by:

$$z = \frac{\lg \frac{a^I}{a^{II}} + \lg \frac{v^{II}}{v^I}}{\lg \frac{C^I}{C^{II}} + \lg \frac{v^{II}}{v^I}} \quad (2)$$

and if the equivalent exchange capacities of the two resins are the same:

$$z = \frac{\lg \frac{a^I}{a^{II}}}{\lg \frac{v^{II}}{v^I}} + 1 \quad (3)$$

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A057/A129

Determination of the charge of polynuclear....

The experimental determination of α as well as of the specific volumes of the swollen ion-exchange resin must be carried out under the same conditions. The investigated element must be ions. The ion-exchange must be strictly reversible and the complexes must be stable. According to Ye.I. Il'yenko, B.P. Nikol'skiy and A.M. Trofimov [Ref. 5: Tr. komissii po analiticheskoy khimii (Proceedings of the commission for analytical chemistry), Izd. AN SSSR (Ed. AS USSR), 9 (12), 148 (1958)] reversibility is not always maintained in exchange of ruthenium complex-es. The present authors demonstrated in corresponding experiments that by adding HNO_3 solution the red complex changes into a yellow complex, thus exchange using H^+ ions cannot be carried out. It was observed that in $NaNO_3$ solutions the com-plex is stable, and is strongly adsorbed on sulfonated KУ-2 (KU-2) cation ex-change resin. About 50% of the red complex is adsorbed from 3.5 N $NaNO_3$ solu-tion. Solutions containing between 0.5 and 5 mg/l ruthenium obey Beer's law with an absorption maximum at 460 mμ. Thus the present experiments were carried out with concentrations of 1.5 mg Ru/l, reversibility was tested and α was determined as ~3,400. Two samples of the resin (containing 2% or 12% divinylbenzene) were soaked in 3.5 N $NaNO_3$ solution and the specific volumes were determined picnome-trically with octane resin with 2% divinylbenzene 1.83 ± 0.01 ml/g; with 12% divinylbenzene 1.37 ± 0.01 ml/g. The swelling capacity is doubled in water.

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Determination of the charge of polynuclear....

S/186/60/002/001/013/022
A057/A129

Since the exchange capacities for both resins are 4.83 - 4.85 mg equiv/g the cal-
culations were done according to equation (3). The concentration of ruthenium in
the initial and in equilibrated solutions was determined with a recording CФ-2M
(SF-2M) spectrophotometer and ФЭК-2M (FEK-2M) photoelectrocolorimeter using green
filters. From the obtained results (see Fig.) the charge of the complex was cal-
culated with z = 5.9. Thus data presented by Fletcher et al. are confirmed; on
the other hand it is demonstrated that the present method can be used for deter-
minations of the charge of polynuclear complexes. There are: 1 figure and 5
references: 2 Soviet-bloc and 3 non-Soviet-bloc.

SUBMITTED: November 13, 1959

Card 4/5

GRINBERG, A.A.

Theory of the anisotropic photomagnetic effect in germanium.
Fiz. tver. tela 2 no.1:153-156 Jan '60.   (MIRA 14:9)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
        (Photomagnetic effect) (Germanium)

24392
S/186/60/002/002/006/022
E071/E433

21.4200

AUTHORS: Bykhovskiy, D.N. and Grinberg, A.A.

TITLE: Coprecipitation of trivalent cerium with uranium oxalate

PERIODICAL: Radiokhimiya, 1960, Vol.2, No.2, pp.164-174

TEXT: There are many phenomena in the field of coprecipitation of an admixture with a non-isomorphic carrier which are not . . . sufficiently explained. For this reason, the authors investigated the coprecipitation of cerium with uranium oxalate.   The determinations of uranium were made by titration with potassium permanganate and of cerium by β activity, using cerium-144 as an indicator.   The crystallization experiments were carried out at 20 $\pm$ 1°C.   On precipitation of small quantities of uranium (IV) from the supersaturated solution (20 to 40 mg in 100 ml of solution) in the presence of an excess of oxalic acid, the distribution of cerium between the precipitate and solution corresponded to the logarithmic formula. At a certain excess of oxalic acid, the crystallization coefficient λ remains constant, irrespective of the amount of the carrier precipitated.   With an increasing concentration of oxalic acid λ noticeably increases (e.g. with an excess of $H_2C_2O_4$ of 0.01 M $\lambda = 1.9$ and

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$0.02 M \lambda = 2.4$).   Although the solubility of cerium oxalate under
experimental conditions (at a concentration of hydrochloric acid
of 1 M and of oxalic acid of 0.01 M   the solubility of cerium
oxalate is 500 times higher than that of uranium oxalate) was
considerably higher than the solubility of uranium oxalate, yet the
enrichment of the solid phase by cerium was observed.   On
coprecipitation of cerium in the absence of an excess of oxalic
acid, the crystallization coefficient λ decreases.   The influence
of pH on λ was investigated within a range of hydrochloric acid
concentrations from 0.5 to 3 M.   The results indicate that the
coprecipitation is governed by the concentration of oxalate ions.
The influence of the concentration of cerium on its coprecipitation
was studied by means of additions of non-active cerium up to
concentrations comparable to the uranium concentration.   At low
concentrations of cerium (below 10^{-6} M)   its coprecipitation is
independent of the concentration.   At higher concentrations, not
exceeding the solubility of cerium oxalate under experimental
conditions, crystals with a definite uranium to cerium ratio,
independent of their ratio in the solution, are precipitated.   The
composition of the precipitates obtained at a concentration of
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cerium of 10^{-3} M is characterized by the ratio of U:Ce:C_2O_4 =
3.9:1.0:9.5 which corresponds to the formula $8U(C_2O_4) \cdot Ce_2(C_2O_4)_3$
(water of crystallization not taken into account). The ratio of
uranium to cerium in the precipitate left in contact with the
solution steadily increases. Since the coprecipitation of cerium
takes place in accordance with the laws of primary adsorption, it
was expected that cations which are capable of some interaction
with uranium ions should have some influence on the coprecipitation
of cerium. The experimental results show that bismuth and calcium
salts ($Bi(NO_3)_3$, $CaCl_2$) lower the coefficient of crystallization (λ)
while other admixtures tested (KCl, K_2SO_4, UO_2Cl_2) have a similar
influence when present at higher concentrations (0.1 to 0.5 M).
On prolonged contact of the crystals obtained by coprecipitation of
uranium and cerium with the solution, the return of cerium from the
solid phase into the liquid phase is always observed. It is a
characteristic feature of the system studied that the approach to
equilibrium is attained with great difficulty and, in practice, the
mixed crystals are never in equilibrium with the solution. The
concentration of cerium in the solution increases with time and
does not attain a constant value in five to eight months. The true
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coefficient of crystallization D is only $(1-3) \times 10^{-3}$ and the fact that $\lambda \gg D$ is the main feature of the system which presents difficulties in placing it in the existing classification of coprecipitation processes.   There are 1 figure, 10 tables and 16 references: 12 Soviet-bloc and 4 non-Soviet-bloc.   The four references to English language publications read as follows: H.M.Dawson, Ch.R.Hoskins, J.E.Smith, J.Chem.Soc., 1884 (1929); H.M.Dawson, J.E.Smith, J.Chem.Soc., 2530 (1929); J.M.Kolthoff, Ch.Rosenblum, J.Am.Chem.Soc., 56, 1658 (1934); A.H.Booth, Trans.Farad.Soc., 47, 633 (1951).

SUBMITTED: July 9, 1959

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E071/E433

AUTHORS: Grinberg, A.A. and Mironov, V.Ye.

TITLE: On the exchange of additives in ions HgH_4^{2-}
           (H^--Cl^-, Br^-, J^-, SCN^-)

PERIODICAL: Radiokhimiya, 1960, Vol.2, No.2, pp.249-254

TEXT: It is known that the velocity of exchange of additives in complex compounds of divalent platinum depends mainly on the nature of coordinated groups and noticeably increases in the following series of anions – additives: Cl^-, Br^-, J^-, CN^-. As the stability of complex ions of the type PtX_4^{2-} (X^--Cl^-, Br^-, J^-, SCN^-, CN^-) in the first approximation is similar to that of HgX_4^{2-}, the authors thought it would be of interest to investigate the exchange in the systems HgH_4^{2-} - H^-(H^--Cl^-, Br^-, J^-, SCN^-) for which there are no sufficient literature data. The investigation was done using radioactive isotopes of Cl^{36}, Br^{82}, J^{131}, S^{35}. The experimental procedure was to place a given volume of 0.04 M aqueous solutions of $K_2[HgH_4]$ in to one compartment of a flask with a ω shaped bottom, and in the other compartment an equal volume of a 0.16 M solution of KH. After obtaining a

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temperature of $25°C \pm 0.1°C$, the solutions were mixed in 2 to 3 sec. Immediately after mixing, or after given time intervals, 1.2 to 2 times excess of a precipitant $[Pt(NH_3)_4]Cl_2$, $[Pt(NH_3)_4](NO_3)_2$ or $[Ni\ en_3]SO_4$ (en = ethylenediamine) was introduced. The precipitate formed was filtered off, washed to a constant activity of the filtrate and dried at 80 to 90°C for 30 to 50 minutes. The activity of the dried precipitates was determined in accurately weighed samples dissolved in appropriate solvents. The experiments were also repeated at 2°C and in the presence of oxidants and using dark vessels. It was found that at 25°C and a pH = 5.6, a complete exchange of additives takes place in 3 to 5 sec. Lowering the temperature to 2°C and carrying out the experiments in aqueous alcoholic (50/50) solutions or in the presence of potassium permanganate did not noticeably decrease the velocity of exchange. A high velocity of exchange in all the mercury systems studied did not permit establishing any dependence of the velocity of exchange on the nature of the coordinated groups. It was also found that the solubility of $[Pt(NH_3)_4]\ [HgCl_4]$ in water at 25°C equals 2.6×10^{-3} mole/l and of $[Ni\ en_3]\ [HgCl_4]$ at Card 2/3

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$18°C$ is about 1.2×10^{-2} mole/l.   There are 2 tables and
7 references: 5 Soviet-bloc and 2 non-Soviet-bloc.   The references
to English language publications read as follows:
A.M.Adamson, J.P.Welker, M.Volpe, J.Am.Chem.Soc., 72, 4030 (1950);
R.L.Rich, H.Taube, J.Phis.Chem., 58, 1, 1 (1954).

SUBMITTED: July 4, 1959

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AUTHORS: Grinberg, A. A., Borzakova, S. S.

TITLE: On the thiocyanogen ion exchange in $K_2[Pt(SCN)_4]$ and $K_2[Pt(SCN)_6]$

PERIODICAL: Radiokhimiya, v. 2, no. 5, 1960, 574 - 583

TEXT: The present article submits the data for the exchange reaction in the system:

$$K_2[Pt(SCN)_4] + 4KS^*CN \text{ and } K_2[Pt(SCN)_6] + 6KS^*CN.$$

It is pointed out that in the systems investigated by the authors, containing addends with sulfur, there is a strongly defined zero exchange noted. The isotope exchange of thiocyanogen ions in the above-mentioned systems was investigated, depending on the time, concentration of the complex and concentration of the free thiocyanogen ions. The $K_2[Pt(SCN)_4]$ was prepared from the reaction (Ref. 5: G. B. Buchton, Ann Chem. u. Pharm., 92, 280, 1854). $4KSCN + K_2[PtCl_4] = K_2[Pt(SCN)_4] + 4KCl$. The $K_2[Pt(SCN)_6]$ was prepared in

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a similar way from the reaction $6KSCN + K_2[PtCl_6] = K_2[Pt(SCN)_6] + 6KCl$.
The potassium thiocyanogen, labelled with S^{35} was prepared by melting
$K_4[Fe(CN)_6]$ with sulfur, to which S^{35} was added (Ref. 6: Yu. V. Karyakin,
Chistyye khimicheskiye reaktivy, 192, Goskhimizdat, M. L., 1947). The
authors dealt particularly with the question to what extent the exchange
between the precipitate and active solution takes place in 5 min. Special
experiments were performed to determine the value of the "zero" exchange
between the freshly-precipitated non-active precipitates $[NiEn_3][Pt(SCN)_4]$
and $[NiEn_3][Pt(SCN)_6]$ and the solutions of the active potassium thiocyano-
gen in 5 min. The result showed

$$F_0 = \frac{x_{precipitate}}{x_\infty} = 0.31 - 0.34 \text{ (temperature 20}^0\text{C)}, \text{ for}$$

the $[NiEn_3][Pt(SCN)_4]$ precipitate, and $F_0 = 0.30$ for the case of
$[NiEn_3][Pt(SCN)_6]$. F, the degree of exchange is said to be the ratio of
activity, occuring in the complex for a given period of time (x_t), to the
activity which should occur in the complex when an equilibrium distribution
(x_∞) is reached, i.e.,

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$$F = \frac{x_t}{x}.$$

The rate of exchange in the thiocyanogen system is said to depend on the illumination. Figure 1 and 2 show graphically the results of the exchange experiments, and Figure 3 shows the relationship of the rate of exchange to the concentration of the complex. The rates of the exchange reactions were calculated from the formula, taking into account the induced exchange (Ref. 7: A. Val', N. Bonner. Ispol'zovaniye radioaktivnosti pri khimicheskikh issledovaniyakh, 12, Izd. IL, M.,1954):

$$R = - \frac{ab}{(a + b)\,t} \left[\ln(1 - F) - \ln(1 - F_0) \right]$$

where a is the concentration of the complex in g-ions of SCN^-/l, b – the concentration of the thiocyanogen ions in g-ions/l. The relationship of the rate of exchange to the concentration of the free thiocyanogen ion is shown graphically in Figure 4. The rates of exchange reactions increase depending on the value of the complex concentration and on the value of the addend

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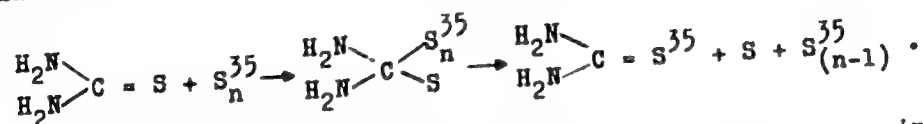
On the thiocyanogen ion ....

concentration both in the thiocyanogen platinite and in the thiocyanogen platinate systems, thus, the values of the exchange rate constants were calculated from the formula $R = kC_1^2 C_2^2$, where C_1 is the concentration of the thiocyanogen platinite in g-ions of SCN^-/l, and C_2 - the concentration of the thiocyanogen in g-ions/l, or according to the formula: $R = kC_1 C_2$, for the thiocyanogen platinate system where C_1 is the concentration of $K_2[Pt(SCN)_6]$ in g-ions SCN^-/l, and C_2 - the concentration of KSCN in g-ions SCN^-/l. In summarizing the results of the experiments the authors bring special notice to the high rate of exchange. The outstanding feature of the system $[Pt(SCN)_4]^{2-} + 4S*CN$ (or $SC*N^-$) (Note: * means $C_2H_5NH_2$), is the high values of the induced exchange, which in turn means in this case, the exchange during the process of the fastest division, i.e., exchange, taking place in the system $[Pt(SCN)_4]^{2-} + 4S*CN$ as a result of the addition of $[NiEn_3]^{2+}$ or $[PtEt_4]^{2+*}$ ions, accompanied by actual instantaneous precipitation of $[NiEn_3][Pt(SCN)_4]$ or $[PtEt_4][Pt(SCN)_4]$ residue formation. Special experiments showed that in the given system the exchange of the freshly-precipitated residue with the active solution takes place much more slowly than the induced exchange. The special effect of the precipitating agent cation is even more apparent in the system $[Pt(SCN)_6]^{2-} + S*CN^-$, whereby,

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in this system the cations differ from one another a great deal not only in
their rate of exchange of the thiocyanogen ion with the ready precipitates,
but in the value of the induced exchange during the process of precipitation.
It is further pointed out that the induced exchange in the case of the
thiocyanogen platinate system is expressed more weakly than in the thiocya-
nogen platinite system. The nature of the induced exchange is assumed to
be connected to some extent with the ability of the mutual combining of the
groups, containing sulfur. A similar combination is expressed in the syn-
thesis process of the labelled sulfur in thiourea, according to the method
of Kukhtenko and Mikhlukhin (Ref. 11: DAN SSSR, 100, 5, 921, 1955):

$$\begin{matrix} H_2N \\ H_2N \end{matrix}\!\!>\!C = S + S_n^{35} \rightarrow \begin{matrix} H_2N \\ H_2N \end{matrix}\!\!>\!C\!<\!\begin{matrix} S_n^{35} \\ S \end{matrix} \rightarrow \begin{matrix} H_2N \\ H_2N \end{matrix}\!\!>\!C = S^{35} + S + S_{(n-1)}^{35} \cdot$$

The given data were found to show that the degree of exchange in the system
$[Pt(SCN)_4]^{2-}$ + S*CN increases much more strongly than it should when the
relationship to the first degree of concentration of the complex is present
(Table 1). Attention is drawn also to the fact that the rate of exchange

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is directly proportional to the second degree of concentration of the free thiocyanogen ion. The first relationship signifies that during the process of the activity occurence in the complex ion, the exchange of the thiocy- anogen ions between two complex ions plays an important role. The second relationship is in accordance with the theory of the intermediary addition of SCN^- ions to the $[Pt(SCN)_4]^{2-}$ ion. The detected relationships are in accordance with the hypothetical mechanism by which two ions of $[Pt(SCN)_4]^{2-}$ interact with one another due to the oxidation-reduction interaction:

$$2 [Pt^{(II)}(SCN)_4]^{2-} \rightleftharpoons [Pt^{(I)}(SCN)_4]^{3-} + [Pt^{(III)}(SCN)_4]^{-}.$$
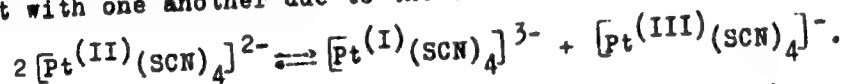
Submitted data showed that the nature of the exchange in the system $[Pt(SCN)_6]^{2-} + S*CN$ differs greatly from the nature of exchange in the system $[Pt(SCN)_4]^{2-} + S*CN^-$. The period of semi-exchange in the thiocyano- gen platinate system is said to be greater than that of the thiocyanogen platinite system. It is pointed out that for the system $[Pt(SCN)_6]^{2-}$, the rate of exchange depends on the complex concentration in the 1.6 degree, and in the concentration of the thiocyanogen ion, it depends on the first degree. It is assumed that an elevated order of the reaction with respect to the complex should be associated with the oxidation-reduction mechanism

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of the exchange. Concluding, the authors state, that they were able to show that the period of semi-exchange T in the system $[Pt(SCN)_4]^{2-}$ + S*CN (or SC*N$^-$) at a temperature of 22°C, concentration of the $K_2Pt(SCN)_4$, equal to $0.5 \cdot 10^{-2}$M and concentration of the potassium thiocyanogen 2.10^{-2} M, equals about 6 - 7 min. In the system $[Pt(SCN)_6]^{2-}$ + S*CN$^-$, at a concentration of the complex $0.5 \cdot 10^{-2}$M, the concentration of the KS CN 3.10^{-2} M and at the same temperature the period of semi-exchange is about 19 min. It was further shown that the rate of exchange in the thiocyanogen platinite system changes proportionately to the second degree of the complex concentration and to the second degree of concentration of the free thiocyanogen ions. In the thiocyanogen platinate system, the rate of exchange depends on the concentration of the free thiocyanogen ions in the first degree, and on the concentration of the complex in the degree 1.6. There are 4 figures and 4 tables, 13 references: 9 Soviet-bloc and 4 non-Soviet-bloc. The four English language publications read as follows: G.B. Buckton, Ann. Chem. u. Pharm. 92, 280, 1854; L. F. Grantham, T. S. Ellman, D. S. Martin, J. Am. Chem. Soc., 77, 11, 2965, 1955; G.W. Watt, R. E. McGarley, J. Am. Chem Soc., 79, 13, 3315, 1957; G. W. Watt, R. E. McGarley, J. Am. Chem. Soc., 79, 17, 4585, 1957.

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AUTHORS: Grinberg, A. A., Nikol'skaya, L. Ye.

TITLE: Concerning the influence of the solvent on the speed rate of the isotope exchange in complex platinum compounds

PERIODICAL: Radiokhimiya, v. 2, no. 5, 1960, 584-59:

TEXT: Referring to the great influence which solvents may have on the speed rate of chemical reactions in general, and on the isotope exchange rate in particular, the authors emphasize that a great number of studies have been made in this field, since labeled atoms could be utilized in this type of experiments. Great attention has been paid to a large group of studies on the exchange between halogen ions and alkyl halogenides. However, the influence of the solvent on the exchange in complex platinum compounds has been investigated very seldom. Regarding this problem, the authors mention a book by F. Basolo and R. G. Pearson (Ref. 4: Mechanism of inorganic reactions. A study of metal complexes in solution. N. Y. 1958), where a sofar unpublished study by Wilkins and Lewis on the exchange of

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chlorine in cis- and trans-isomers of $[Pt(P(C_2H_5)_3)_2Cl_2]$ in acetone is quoted. The Russian scientists, very interested in this type of complexes, investigated the influence of the solvent on the exchange of addenda in $Pt^{(II)}$ complexes. Being aware of the great difficulties in a systematic research on this subject, they began to study the exchange problems in the systems $K_2[Pt(SCN)_4]$ + KSCN in acetone. The exchange kinetics in water for this system has been studied by one of the authors: associate S. S. Borza-kova (Ref. 5: Radiokhimiya, 2, 5, 538, 1960). Thus, data on the reactions in these two solvents, i.e. acetone and water may be compared with each other. The experimental part comprises the following main features: It was decided to use for the exchange reaction potassium thiocyanogen, labeled with the isotope S^{35}, which has been synthesized by melting of ferrous potassium thiocyanate with sulphur. Acetone was purified, twice distilled after a shake treatment with solid $KMnO_4$; after another shaking procedure with silver nitrate and sodium hydrate, it was filtered, dried over $CaSO_4$ and fractionated during distillation. The acetone solution of $K_2[Pt(SCN)_4]$ and $KS*CN$ of

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a given (unspecified) concentration were mixed in a centrifuge test tube
of a 10-15 ml volume which was closed with a ground stopper and left in the
dark for a given (unspecified) period of time. After precipitation of the
anion complex, the solution with the precipitate was centrifuged, the pre-
cipitate washed and put on a suspended aluminum plate, and its activity was
measured with an end-window beta-counter. Special attention had to be paid to
the separation after the exchange process. It seemed to be convenient to use
the complex cation $[Pt(NH_3)_4]^{2+}$ as a precipitator for $[Pt(SCN)_4]^{2-}$, which in
similar experiments with exchanges in aqueous solutions provided for good
separation conditions in systems of the type $[PtX_4]^{2-} + X^-$ (with a not too
long exchange period). However, none of the halogenides of the first Reyze
base proved to be soluble in acetone. On the other hand, the perchlorate
$[Pt(NH_3)_4](ClO_4)_2$ proved to be soluble, obtained by the authors by adding
an additional amount of $HClO_4$, which was theoretically required in accord-
ance with the corresponding equation, to the solution of $[Pt(NH_3)_4](OH)_2$
Owing to the low solubility in water ,the perchlorate I Reyze may be ob-
tained through the reaction of $HClO_4$ with $[Pt(NH_3)_4]Cl_2$. The solubility

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of $\left[\text{Pt}(\text{NH}_3)_4\right](\text{ClO}_4)_2$ in acetone is 0.3 g in 100 ml acetone, and this com-
pound may be used for the precipitation of platinothiocyanide from acetone
solutions. A disadvantage in this process is the appearance of $\text{Pt}(\text{NH}_3)_4(\text{SCN})_2$
which has to be sparged off from the centrifuged precipitate. Precipitation
in acetone did not occur instantenously but took several minutes. Analyses
of the precipitate proved that there was no deviation from the basic com-
position in the precipitated salts. Then, the exchange products were studied
as to their dependence on time, the concentration of the complex and the
concentration of the addendum, i.e. KSCN, in all cases at 18-19°. For the
calculation of the exchange rate over a given period of time, the authors
used R. Prestwood's and A. Wahl's (Ref. 9: J. Am. Chem. Soc., 71, 9, 3137,
1949) formula

$$F = \frac{F - F_o}{1 - F_o} \quad ,$$

which takes into account the zero exchange correction, i.e. the exchange in
the separation process and the incomplete separation which have to be con-
sidered, too. The zero exchange in the system $\text{K}_2\left[\text{Pt}(\text{SCN})_4\right]+$ KSCN proved to

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be the same in all experiments. Apparently the dependence of $1 - F$ on the time (see table 2) by taking into account the zero exchange, express-ed in semi-logarithmic coordinates in Figure 1, was found to be a straight line crossing the ordinate axis in a point corresponding to the unit. Thus it is assumed that the rate of the reaction R abides by the simple ex-ponential law and may be calculated from the formula of simple exchange:

$$R = \frac{-ab}{a + b} \frac{\ln(1 - F)}{t}$$

For the concentrations $0.55 \cdot 10^{-2}$ M (or equally $2.2 \cdot 10^{-2}$ g-ion. $SCN^-/1$) in the complex and $2.2 \cdot 10^{-2}$ M in KSCN, R was found to be equal to $0.35 \cdot 10^{-5}$ g-ion. $SCN^-/1.min$. The period of semi-exchange $\tau_{\frac{1}{2}}$ under the given condi-tions and determined from Figure 1 was found to be equal to 37 hours. For the reaction in water, the same concentrations and temperatures provided, the value $\tau_{\frac{1}{2}}$ was found to be equal to 6-7 minutes. The tremendous differ-ence in the exchange rate in the two media, with a speed rate of 340 times lower in acetone than in water, as found by S. S. Borzakova(see ref. 5) is assumed to have its origin in a considerable different course of the reaction mechanism which takes place in the two media. Subsequently, the

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degree of the dependence on the concentration of the complex in the ex-
change process has been studied. In these experiments, the concentration
of the solution as to KSCN, equal to $2.2 \cdot 10^{-2}$ M, remained always constant,
while the concentration as to $K_2[Pt(SCN)_4]$ did change. Tabulated data and
the curves in Figures 2 and 3, obtained in 50-hr and 25-hr studies showed
that the order of the reaction with respect to the complex, determined by
the ratio $\frac{\partial \lg R}{\partial \lg a}$, is close to the first (1 ~ 1.4). Finally, the degree of
the dependence on the concentration of the addendum has been investigated.
The concentration on $K_2[Pt(SCN)_4]$ in all cases was equal to $0.55 \cdot 10^{-2}$ M,
i.e. to $2.2 \cdot 10^{-2}$ g-ion SCN^-/l. The exchange time equaled 25 and 18 hrs.
Apparently, a dependence of the exchange rate on the concentration of the
addendum was noticed. The order of the reaction with respect to KSCN came
also close to the unit, i.e. to the first order. The degree of dependence
on the concentration of KSCN is given in Figure 4. Arriving at the con-
clusions the authors first compare the data of this study with similar
systems in aqueous solution of the type
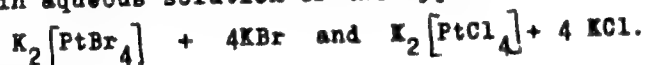
$$K_2[PtBr_4] \quad + \quad 4KBr \quad \text{and} \quad K_2[PtCl_4] + 4 \text{ KCl.}$$

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In accordance with studies made by A. A. Grinberg /the author/ and G. A. Shagisultanova (Ref. 10: Izv. AN SSSR, OKhN, 6, 981, 1955) and by L. F. Grantham, T. S. Elleman and D. S. Martin (Ref. 7: J. Am. Chem. Soc., 77, 10, 2965, 1955), the exchange rate in the above mentioned systems did not depend on the concentration of the addendum, and the exchange chiefly took place through the medium of aqua-ions being formed intermediately. There is no doubt that in this case, i.e. in the study of the authors, a clearly ex-pressed dependence of the exchange rate on the concentration of the adden-dum does exist, and that, by the same token, there is a difference in the mechanism as compared to that prevailing in the above mentioned systems in aqueous solutions. The tremendous difference in the exchange rates in $K_2\left[Pt(SCN)_4\right]$ when replacing water by acetone as a solvent, primarily may be accredited to the greatly different capabilities of H_2O and CH_3COCH_3 molecules to penetrate into the interior sphere of the $\left[Pt(SCN)_4\right]^{2-}$ ion, and also to the differing dielectric constant values. Of considerable in-terest is the practical identy of the absorption spectra of the two com-plexes $K_2\left[Pt(SCN)_4\right]$ and $\left[Pt(NH_3)_4\right]\left[Pt(SCN)_4\right]$. In this given case and in

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the solid state no anomalous colorations of the Magnus and Beelman type salts have been noted. The relatively difficult solubility of the perchlorate of the first Reyze base in water deserves special attention, since one may assume that the perchlorate ions might prove useful as precipitators for some other bivalent complex ions of the tetrammine type, in connection with the already known reaction with cadmium resulting in the formation of a difficultly soluble product of the composition:

$[Cd(NH_3)_4](ClO_4)_2$.

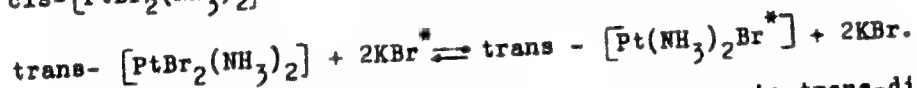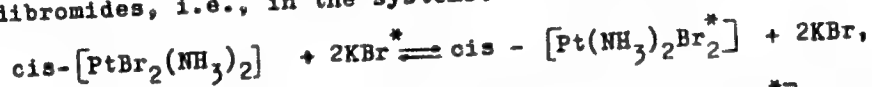Card 8/10

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A051/A130

AUTHORS: Grinberg, A. A.; Shagisultanova, G. A.

TITLE: The substitution of bromine in cis-trans-diammindibromide
               bi-valent platinum.

PERIODICAL: Radiokhimiya, v. 2, no. 5, 1960, 592 - 595

TEXT: A study was made of the substitution reactions in cis-trans-
-diammindibromides, i.e., in the systems:

$$cis-[PtBr_2(NH_3)_2] + 2KBr^* \rightleftharpoons cis - [Pt(NH_3)_2Br_2^*] + 2KBr,$$

$$trans- [PtBr_2(NH_3)_2] + 2KBr^* \rightleftharpoons trans - [Pt(NH_3)_2Br^*] + 2KBr.$$

It was shown that the bromine ion exchange in the system cis-trans-diammin-
dibromide platinum-potassium bromoplatinite takes place rapidly. It is as
sumed that the rapid exchange is determined by the migration phenomena of
the bromine from one internal shpere to another. The above-mentioned sys-

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The substitution of bromine in ....

tem is said to be convenient to investigate since the reacting components
are easily separated by precipitation of the green salt of Biil'man (Beel-
man ?) $[Pt(NH_3)_4][PtBr_4^*]$. The exchange of the bromine ions was found to
take place even more rapidly when, under the same conditions trans-diammin
and $K_2[PtBr_4^*]$ are taken. Tables 1 and 2 show that even at very low concen-
tration of the diammines and a correspondingly low concentration of $K_2[PtBr_4]$,
the bromine exchange takes place rapidly, rendering the study of the ex-
change kinetics in the trans-salt impossible. The experimental procedures
used were those described in Ref. 1 and 2 (A. A. Grinberg, G. A. Shagisul-
tanova, Izv. AN SSSR, OKhN, 6, 981, 1955; A. A. Grinberg, G. A. Shagisulta-
nova, Radiokhimiya, 7, 1, 91, 1959). A determination of the values of the
induced exchange showed that these differ significantly in the two cases
investigated, i.e., for the system cis-$[PtBr_2(NH_3)_2]$ + $K_2 PtBr_4$. where
it did not exceed 4%, and the system trans-$[PtBr_2(NH_3)_2]$ + $K_2[PtBr_4^*]$, where
it fluctuated between 8 and 11%. The data of tables 1 and 2, with a correc-
tion added for zero exchange, lead to the conclusion that the period of
semi-exchange for the first system at $C_{PtBr_2(NH_3)_2}$ = $0.26 \cdot 10^{-3}$M,

$C_{K_2PtBr_4}$ = $0.34 \cdot 10^{-3}$M and t^o = 25^oC, is approximately equal to 60 min.

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The substitution of bromine in ....

the period of semi-exchange for the second system in the same concentra-
tions and temperature conditions - the order of 10 - 12 min. Thus, the
bromine in the trans-diammine exchanges much faster than in the cis-diam-
mindibromide, and the bromine in the diammines exchanges much faster than
the bromine in the potassium bromoplatinite in the system

$$K_2\left[PtBr_4\right] + 4KBr^* \rightleftharpoons K_2\left[PtBr_4^*\right] + 4KBr$$
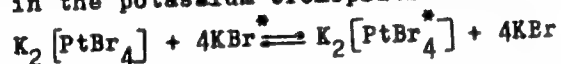
for which $\tau_{\frac{1}{2}}$ = 120 minutes at $C_{K_2PtBr_4}$ = 0.55 · 10^{-2} M and $t^{o}C$ = $20^{o}C$.

Experiments for reverse exchange in the same systems showed that the results
were the same as in the previous case (Table 1 and 2). Experimental results
also confirmed the previous observations on the rapidity of the bromine ex-
change between the complex ions. The authors point out that the exchange
between the complex ions, containing the coordinated bromine ions takes
place much more rapidly than between the $\left[PtBr_4\right]^{2-}$ ions and the free bromine
ions. Another fact brought to light is the atom exchange of bromine between
the trans-$Pt(NH_3)_2$ - Br_2 and $\left[PtBr_4\right]^{2-}$, which takes place faster than in
the case of the cis-isomer. The observed phenomena are explained by the
reaction of the type:

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The substitution of bromine in ....

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$$[Pt(NH_3)_2Br_2] + H_2O \rightleftharpoons [Pt(NH_3)_2H_2OBr]^+ + Br^-$$
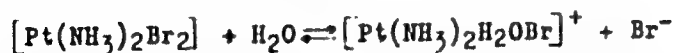
with subsequent mutual attraction of the oppositely-charged complex ions $[Pt(NH_3)_2H_2OBr]^+$, $[PtBr]^{2-}$ and $[PtBr_3H_2O]^-$. Ion-pairs are formed of the $[Pt(NH_3)_2H_2OBr][PtBr_4]^-$ type and correspondingly: $\{[Pt(NH_3)_2H_2OBr][PtBr_4]\}^-$. The rapid exchange observed by the authors between the complex ions as compared with the exchange rate in the system $[PtBr_4]^{2-}$ + free bromine ions help to understand the information discussed in Ref. 2, concerning the presence of the second order raction for the complex in the system $[PtNH_3Br_3]^-$ + 3 KBr^*, and order above one for $[PtBr_4]^{2-}$ + $4KBr^*$. There are two tables and 6 references: 4 Soviet block and 2 non-Soviet-bloc. The English language publications read as follows: D. Banerjea, F. Basolo, R. Pearson, J. Am. Chem. Soc. 79,4055, 1957; F. A. Long, J. Am.Chem. Soc., 73, 3537, 1939.

Card 4/6

BYKHOVSKIY, D.N.; GRINBERG, A.A.

Coprecipitation of trivalent cerium with uranium oxalate.
Radiokhimiia 2 no.6:164-174 '60.   (MIRA 14:4)
                    (Cerium) (Uranium oxalate)

GRINBERG, A.A.; MIRONOV, V. Ye.

Exchange of addends in $Hg I_4^{2-}$ ions. Radiokhimiia 2 no.6:249-254
'60.   (MIRA 14:4)
                        (Mercury compounds)

2l086
3/186/60/002/006/010/026
A051/A129

2.1. 4200

ACTHORS: Grinberg, A.A., Vykhovskiy, D. N., Nikol'skiy, L. Ye.;
Petrzhak, G.I.

TITLE: The formation of tetra-valent uranium oxalate from solutions
using rongalite

PERIODICAL: Radiokhimiya, v. 2, no. 6. 1960, 687 - 690

TEXT: The authors have established the conditions of precipitation of
uranium (IV) oxalate, resulting from the determination of the losses of tetra-
and hexa-valent uranium in filtrates, using rongalite. It is shown that in
the formation of low quantities of uranium the rongalite concentration in the
solution should not be below 0.1 M. Experiments were conducted to establish
the uranium losses in the filtrates after the formation of tetra-valent uranium
oxalate. The results obtained show that at the given concentrations about
40 mg of uranium are left in the solution, whereby the losses seem to be con-
nected with an increased solubility of the tetra-valent uranium oxalate in the
filtrates. The experiments carried out for establishing the conditions of low-
quantity formations of uranium showed that at low concentrations of uranium in

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The formation of tetra-valent ....

S/186/60/002/006/010/026
A051/A129

the solution the rongalite content had to be increased as compared to the theoretically computed quantity. The deviation of the stoichiometry under these conditions is said to be due to the low rate of uranium reduction and the strong effect of the side-reactions taking place at the same time. Further experiments were conducted to check the uranium losses resulting from the addition of small quantities of rongalite to the uranium solution already reduced which noticeably increase due to oxidation of uranium. Rongalite was added to a hydrochloric acid solution of tetra-valent uranium. The results showed that the amount of uranium formed in this case was always less than in similar experiments without rongalite and decreased with time. The quantity of tetra-valent uranium in oxalate residues was determined with an accuracy of 0.1 mg by dissolving the residue in sulfuric acid and titrating it with potassium permanganate. Normal oxalate was obtained in each case at a ratio of $\frac{C_2O_4}{U} = 2$. The quantity of oxidized uranium was determined from the difference, correcting for solubility. The oxidation of uranium in the third series of experiments is thought to take place as a result of certain intermediate compounds formed in the interaction of rongalite and air oxygen. When large quantities

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24086

S/186/60/002/006/010/026
A051/A129

The formation of tetra-valent ....

of rongalite are present, this phenomenon does not occur. There are 3 tables
and 4 references: 3 are Soviet-bloc and 1 non-Soviet-bloc. The reference to
the English language publication reads as follows: W. H. Reas. The Transura-
nium Elements, 423, N.Y., 1949.

SUBMITTED: October 26, 1959.

Card 3/3

68221

5(2) 5.2620

S/078/60/005/02/007/045
B004/B016

AUTHORS: Grinberg, A. A.
              Shagisultanova, G. A.

TITLE: Stability of Complex Compounds of Bivalent Platinum

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 2, pp 260-262
              (USSR)

ABSTRACT: The authors point out that there are only few data available
              in publications concerning the instability constants of
              typical complex compounds of bivalent Pt. They quote in this
              connection a paper by I. I. Chernyayev and S. I. Khorunzhenkov.
              Since many problems arose when investigating reactions of the
              isotopic exchange (Refs 4,5) and substitution (Ref 6), the
              authors determined the instability constants of the following
              processes: $[PtCl_4]^{2-} + H_2O \rightleftharpoons [PtCl_3H_2O]^- + Cl^-$; $[PtNH_3Cl_3]^- +$
              $+ H_2O \rightleftharpoons [PtNH_3H_2OCl_2]^0 + Cl^-$; cis- (or trans-) $[Pt(NH_3)_2Cl_2] +$
              $+ H_2O \rightleftharpoons$ cis- (or trans-) $[Pt(NH_3)_2H_2OCl]^+ + Cl^-$, and
              $[PtBr_4]^{2-} + H_2O \rightleftharpoons [PtBr_3H_2O]^- + Br^-$. The authors added to the
              freshly prepared diluted solutions of the complex compounds

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S/076/60/005/02/007/045
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Stability of Complex Compounds of Bivalent
Platinum

varied quantities of KCl (or KBr), allowed the solutions to
stand in the dark until equilibrium was established, and then
determined the content of aquo ions and the equilibrium con-
centration of the unchanged complex ion. The equilibrium con-
centration of the chlorine- (or bromine-) ion equaled the con-
centration of the halogen salt added plus the concentration of
aquo ions. The calculation of the instability constant is given
for the example $K_2[PtCl_4]$ (Table 1). In table 2, the spread of
the experimental values of the instability constants of
$K[PtNH_3Cl_3]$ is shown. The authors found the following:
1) $K_2[PtBr_4]$ is more stable than $K_2[PtCl_4]$; 2) on transition
from $K_2[PtCl_4]$ to $[Pt(NH_3)_2Cl_2]$, the instability constants
which correspond to the separation of one chlorine ion, de-
crease with increasing substitution of NH_3 for the chlorine
atoms; 3) the instability constant of the reaction
$[Pt(NH_3)_2Cl_2] + H_2O \rightleftharpoons [Pt(NH_3)_2ClH_2O]^+ + Cl^-$ is considerably
smaller in the trans-isomer than in the cis-isomer. The
resultant instability constants have an order of magnitude of

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Stability of Complex Compounds of Bivalent
Platinum

S/076/60/005/02/007/045
B004/B016

10^{-2}. The authors now investigate the problem as to whether
the results obtained may be extended to compounds of bivalent
Pt, in which Br, J or acid radicals are substituted for Cl.
Briefly mentioned are attempts to titrate solutions of
K_2PtCl_4 without addition of KCl, in which connection also a
substitution of the second chlorine ion by H_2O was observed.
There are 2 tables and 6 references, 5 of which are Soviet.

4

SUBMITTED: November 20, 1958

Card 3/3

69052

5.2620

S/078/60/005/03/016/048
B004/B002

AUTHORS: Grinberg, A. A., Snikhayeva, L. V.
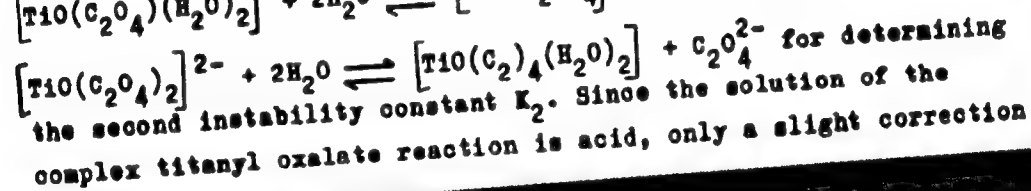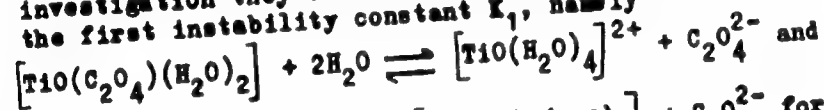
TITLE: The Stability of Complex Titanyloxalate in Solutions

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 3, PP 599-603 (USSR)

ABSTRACT: The authors refer to a paper by B. V. Ptitsyn and L. I. Vinogradova
(Ref 1) who determined the instability constant of $[Fe(C_2O_4)_3]^{3-}$
by means of an oxalate-silver electrode, and state the reasons
for having chosen an oxalate-mercury electrode. The instability con-
stant of $[TiO(C_2O_4)_2]^{3-}$ was determined by means of a potentiometric
titration with HCl and by determining the oxalate ion by means of an
oxalate-mercury electrode. The authors specify the six equilibria
existing in the solution of potassium titanyl oxalate. In their
investigation they chose the following equilibria for determining
the first instability constant K_1, namely

$$[TiO(C_2O_4)(H_2O)_2] + 2H_2O \rightleftharpoons [TiO(H_2O)_4]^{2+} + C_2O_4^{2-} \text{ and}$$

$$[TiO(C_2O_4)_2]^{2-} + 2H_2O \rightleftharpoons [TiO(C_2)_4(H_2O)_2] + C_2O_4^{2-} \text{ for determining}$$

the second instability constant K_2. Since the solution of the
complex titanyl oxalate reaction is acid, only a slight correction

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The Stability of Complex Titanyloxalate in Solutions   S/078/60/005/03/016/048
B004/B002

of the instability constant is necessary. Experimental data are given in table 1. Table 2 gives the concentrations calculated for the complexes and the $C_2O_4^{2-}$ ions, and also the values of K_2. The mean value found was $K_2 = 0.77.10^{-5}$. The values obtained by potentiometric titration with HCl, were examined by means of an oxalate-mercury electrode. Calibration of the electrode by means of potassium oxalate is described. Experimental results are shown in table 3. Table 4 gives the concentrations and values computed as to K_2. $K_2 = 4.1.10^{-5}$. The determination of K_1 was made indirectly on the basis of the general instability constant K_{gen} which by means of potentiometric titration with lye according to Bose (Ref 5), was found to be $1.5.10^{-15}$. Hence, K_1 was computed to be 2.10^{-10}. A. K. Babko and L. I. Dubovenko (Ref 6) spectrophotometrically determined K_1 to be $1.5.10^{-7}$. These values are to be better defined by further investigations. There are 4 tables and 9 references, 6 of which are Soviet.

SUBMITTED: November 25, 1958
Card 2/2

GRINBERG, A.A.; LOZHKINA, G.S.

Extraction of acids with organic solvents. Zhur. neorg.khim. 5
no.3:738-744 Mr '60.   (MIRA 14:6)

(Acids, Inorganic)
(Extraction (Chemistry))

5.2400
$5.2100(B)$

AUTHORS: Grinberg, A. A., V'yugina, A. F.

TITLE: Interaction Between Nitric Acid and Magnesium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5. No. 6,
                pp. 1389 - 1390

TEXT: The present paper is intended to check a paper by C. Montemartini
(Ref. 1) concerning the composition of gases formed by interaction be-
tween HNO_3 and Mg. Pure MA1 (MA1) magnesium (analysis is given) was boiled
with chemically pure HNO_3 in a vessel with a reflux condenser. The gases
were collected under a saturated NaCl solution, and analyzed for NO, N_2O,
O_2, and H_2 in a BTИ(VTI) apparatus. The free HNO_3 and NH_3 was also de-
termined in the solution. Hydroxylamine could not be detected. Experimen-
tal results are given in Figs. 1 and 2. The quantity of released H_2 de-
creases with increasing HNO_3 : Mg ratio. The largest quantity of H_2 is

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Interaction Between Nitric Acid and Magnesium   S/078/60/005/06/29/030
                                                B004/B014

160 g per 1 g of Mg. These gases are explosive because of their high H_2 contents (6 - 32%). Their nitrogen contents were always lower than 75%. When the concentration of HNO_3 varied between C.1 and 3 N, and the HNO_3 : Mg ratio between 1 : 1 and 10 : 1, a fraction of 0.4 molecule of HNO_3 was always consumed for 1 Mg atom to form the individual reaction products. Though the reaction kinetics was not studied, the authors believe that the reaction products containing more than one nitrogen atom are formed by secondary processes, such as $NH_4NO_2 \rightarrow N_2 + 2H_2O$. The au- thors refer to papers by D. I. Mendeleyev (Ref. 2), B. N. Menshutkin (Ref. 3), and B. V. Nekrasov (Ref. 4). There are 2 figures and 7 references: 4 Soviet, 1 British, and 1 Italian.

SUBMITTED: December 15, 1958

Card 2/2

GRINBERG, A.A.; SHAGISULTANOVA, G.A.

Instability constants of bromide complexes of divalent platinum.
Zhur. neorg. khim. 5 no.8:1895 Ag '60.   (MIRA 13:9)
                    (Platinum compounds)

S/020/60/132/05/27/069
BO11/B126

AUTHORS: Grinberg, A. A., Academician, Kukushkin, Yu. N.

TITLE: The Hydrolysis Kinetics of Some Complex Compounds of
            Pt (IV)

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 5,
            pp. 1071 - 1073

TEXT: The object of this paper is to study the hydrolysis kinetics of
the following complexes: $Na_2[PtCl_6]$, $k[PtNH_3Cl_5]$, $[Pt(NH_3)_2Cl_4]$,
$[Pt(NH_3)_3Cl_3]Cl$, trans-$[Pt(NH_3)_4Cl_2](NO_3)_2$, $[Pt(NH_3)_5Cl]Cl_3$, and
$k[PtPyCl_5]$ (Py - pyridine). Hitherto only the isomeric diammines of this
series have not been investigated. In their experiments, carried out in
darkness, the authors used red-lacquered receptacles. The experiments
showed the expected variety in the hydrolysis kinetics of single members
of this series. The dependence of the hydrolysis rate on alkali concen-
tration is expressed in $k[PtNH_3Cl_5]$ and $[Pt(NH_3)_4Cl_2](NO_3)_2$, and also

Card 1/3

The Hydrolysis Kinetics of Some Complex   S/020/60/132/05/27/069
Compounds of Pt (IV)   B011/B126

with a certain approximation in $[Pt(NH_3)_5Cl]Cl_3$ by an equation of the
first order. The hydrolysis rate is independent of the alkali concen-
tration for triammine and pyridine compounds. These compounds are re-
duced during hydrolysis to compounds of Pt (II), as against the unusual-
ly high hydrolysis rate of mono-, tri-, and tetrammine with respect to
the concentration of the complex. When temperature is raised, the re-
duction is greater. Chloroplatinate, pyridine monoammine, and pentam-
mine were not even reduced by alkali on heating under the conditions of
the experiment. The authors give a scheme of the hydrolysis reaction,
and state that the mechanism of the hydrolysis of trans-$[Pt\ en_2Cl_2]^{+2}$

does not reflect the process taking place in the solution. The mechanism
of the interaction of this compound with alkali is much more complicated.
Corresponding investigations are about to be completed, and the results
will soon be published. The authors refer to papers by O. Ye. Zryagintsev
and Ye. F. Karandasheva (Ref. 1). There are 9 references: 5 Soviet and
4 American.

Radium Inst. im V. G. Khlopin, AS USSR --

Card 2/2

GRINBERG, A.A., akademik; GEL'FMAN, M.I.

Stability of complex compounds of divalent platinum. Dokl.AN SSSR
133 no.5:1081-1083 Ag '60.   (MIRA 13:8)

1. Leningradskiy tekhnologicheskiy institut im. Lensoveta.
        (Platinum compounds)

31886

S/186/61/003/005/003/022

E071/E485

21.4300

AUTHORS: Grinberg, A.A. and Bykhovskiy, D.N.

TITLE: Coprecipitation of microquantities of thorium
(uranium X_1) with uranium oxalate

PERIODICAL: Radiokhimiya, v.3, no.5, 1961, 528-534

TEXT: Since oxalates of thorium and tetravalent uranium are
isomorphic and ions of U^{4+} and Th^{4+} are close in their dimensions,
an isomorphic coprecipitation should take place in this system.
The authors studied this coprecipitation process under various
crystallization conditions in order to find out how the process
could be utilized for the separation of the thorium isotope
uranium X_1, from uranium salts.   It was also intended to compare
the behaviour of an isomorphic admixture with a non-isomorphic one,
e.g. with the coprecipitation of trivalent cerium with uranium
oxalate which was studied previously (Ref.5: D.N.Bykhovskiy,
A.A.Grinberg, Radiokhimiya, v 2. 2. 164 (1960)).   The experimental
procedure was the same as in the abovementioned work.   It was
found that on precipitation of uranium X_1 with uranium oxalate
from a supersaturated solution the distribution of uranium X_1

X

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3

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S/186/61/003/005/003/022

Coprecipitation of microquantities ... E071/E485

corresponds to the logarithmic formula. The coefficient of distribution λ increases with increasing concentration of oxalate ions. The isomorphic system $UX_1(C_2O_4)_2 - U(C_2O_4)_2$ differs from the non-isomorphic $Ce^{III} - U(C_2O_4)_2$ system in its stability of the mixed crystals formed. Since UX_1 coprecipitates with uranium oxalate (IV) with an enrichment of the solid phase, its quantitative separation can be achieved on precipitation of small quantities of uranium (IV). By precipitating UX_1 in the form of oxalate with some uranium (IV) it can be separated from the main mass of uranium present in the six valent state. Preliminary synthesized oxalate can be used as a source of the tetravalent uranium. In the dry state, this salt can be stored. The necessary amount of uranium oxalate can be dissolved on heating in an aqueous solution of either potassium or ammonium oxalate (2 moles of $K_2C_2O_4$ or $(NH_4)_2C_2O_4$ per 1 mole of $U(C_2O_4)_2$). The other method is to reduce with rongalite a small amount of six valent uranium present in the solution from which UX_1 is to be separated. The best results were obtained when the initial concentration of uranium (IV) was about 30 g/litre, under these conditions an enrichment by a factor of 100 is obtained with practically complete

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S/186/61/003/005/003/022
Coprecipitation of microquantities .. E071/E485

separation of UX_1. The presence of a large quantity of uranyl
makes the precipitation of tetravalent uranium oxalate difficult.
In such cases, it is advantageous to first precipitate uranyl
oxalate and then from the filtrate, containing a small quantity of
uranium and practically the whole UX_1, separate UX_1 with oxalate
of tetravalent uranium. By repeating the process the necessary
degree of enrichment in UX_1 can be obtained. The subsequent
separation of UX_1 from uranium can be done using an iron exchange
resin. The authors used cationite KY-2 (KU-2). Thus a method
of separation of uranium X_1 from uranium based on the ability of
uranium X_1 to coprecipitate with uranium oxalate and not to
coprecipitate with uranyl oxalate was developed. It is claimed
that this method can compete with the ether extraction normally
used for this purpose. There are 5 tables and 10 references:
5 Soviet-bloc, 1 a Russian translation from non-Soviet-bloc
publication and 4 non-Soviet-bloc. The three references to
English language publications read as follows:
Ref.3. A.H.Booth, J. Chem. Educ., v.28, 3, 144 (1951),
Ref.4: A.E.Taylor, P.T.Dillon, Anal. Chem., v.24, 10, 1624 (1952);
Ref.6: M.Bose, D.M.Chowdhury, J. Indian Chem. Soc., v.31, 2, 111
Card 3/⒉   (1954).

GRINBERG, A.A.; 3HAGISULTANOVA, G.A.

Exchange of bromine in potassium monopyridinetribromoplatoate.
Radiokhimiia 3 no.6:694-700 '61.   (MIRA 14:12)
                    (Bromine)
                    (Platinum compounds)

GIL'DING, A.A.; GIL'DENGERSHEL', Kh.I.; SISHSKAYA, V.V.

Mixed methylamine-ammonia platinum pentam ine and its acidic pro-
perties. Zhur. neorg. khim. 6 no.1:90-94 '61.   (MIRA 14:2)
                    (Platinum compounds)

GRINBERG, A.A.; SLOBIDSKAYA, D...

Kinetics of the reactions between platinites and amines. Zhur. neorg.
khim. 6 no.1:95-102 '51.   (MIRA 14:2)
            (Amines)   (Potassium bromoplatinate)
                    (Potassium chloroplatinate)

GRINBERG, A.A.; SHOLETSKAYA, D.B.

      Kinetics of the interaction of amines with Coa. type salts. Zhur.
neorg. khim. 6 no.1:103-110 '61.   (MIRA 14:2)
          (Amines)   (Platinum compounds)

GRINBERG, A.A.; ST..RSE.. .O, A.I.

Acid-base properties of the .i trans isomers of $[Pt(NH_3)_2(NO_2,OH)_2]Cl_2$.
(.:. A :4: :)
Zhur. neor.. K:..., 6 no.1:111-119 no.1: '61.
(Platinum compounds)

GRINBERG, A.A.; KHAKIMOV, Kh.Kh.

Stability constants of cobalt complexes with certain vitamins. Zhur. neorg. khim. 6 no.1:144-152 '61.   (MIRA 14:2)
(Cobalt compounds)

S/078/61/006/002/003/017
B017/B054

AUTHORS: Grinberg, A. A., Astapovich, V. I.

TITLE: Study of Oxalic Acid Complex Compounds of Zirconium

PERIODICAL: Zhurnal neorganicheskoy khimii, 1961, Vol. 6, No. 2,
              pp. 321 - 329

TEXT: To separate zirconium and hafnium, the oxalate complexes of these
elements have recently been studied in detail (Ref. 8). A. N. Yermakov,
V. K. Belyayeva, and I. N. Marov (Ref. 9) studied the possibilities of
separating zirconium and hafnium by ion exchangers with the aid of oxalate
complexes. V. F. Saksin (Ref. 11) studied the zirconyl oxalate complexes.
In the present paper, the authors checked the conditions of producing
simple and complex zirconium oxalates. The following compounds were pro-
duced: $ZrOC_2O_4 \cdot nH_2O$, $Zr(C_2O_4)_2 \cdot nH_2O$, and $K_4 Zr(C_2O_4)_4 \cdot 4H_2O$. Some physico-
chemical properties of zirconium oxalate and potassium zirconium oxalate
were studied; results are given in Tables 1 and 2. The calcium, barium,
cadmium, and lead salts were synthesized by exchange of the potassium ion

Card 1/2

Study of Oxalic Acid Complex Compounds
of Zirconium

S/078/61/006/002/003/017
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in the potassium zirconium oxalate complex. The chemical formulas of these compounds are as follows: $Ca_2[Zr(C_2O_4)_4]\cdot5.5H_2O$, $Ba_2[Zr(C_2O_4)_4]\cdot7H_2O$, $K_2Cd[Zr(C_2O_4)_4]\cdot5.4H_2O$, and $Pb_2[Zr(C_2O_4)_4]\cdot3H_2O$. The stability constant of the zirconium oxalate complex was determined; results are given in Table 3. K_H was found to be 10^{-4}. There are 3 tables and 13 references: 5 Soviet, 2 US, 3 French, and 3 German.

Card 2/3

GRINBERG, A.A.; KUKUSHKIN, Yu.N.

Hydrolysis kinetics of some complex compounds of tetravalent platinum.
Zhur.neorg.khim. 6 no.5:1084-1097 My '61.   (MIRA 14:4)

(Platinum compounds)

GRINBERG, A.A.; NIKOL'SKAYA, L.Ye.; SHAGISULTANOVA, G.A.

Chromatographic method for determing the structure of
coordination polymer compounds. Zhur. neorg. khim. 6 no.7:
1497-1500 Jl '61.   (MIRA 14:7)
                     (Platinum compounds) (Ammonia)

GRINBERG, A. A.

Present state and prospects of the development of coordinative chemistry. Analele chimie 16 no.4:45-55 O-D '61.

(Chemistry)

GRINBERG, A.A., akademik; STETSENKO, A.I.; IN'KOVA, Ye.N.

Acidic properties of cis- and trans-isomers of $[Pt(glh)_2(NH_3)_2]$ Cl_2.
Dokl. AN SSSR 136 no.4:821-823 F '61.   (MIRA 14:1)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.
                    (Platinum compounds)

GRINBERG, A.A., akademik; GEL'FMAN, M.I.

Stability of complex compounds of divalent platinum. Compounds
of the tetramino type. Dokl. AN SSSR 137 no. 1:67-70 Mr-Ap '61.
(MIRA 14:2)

1. Leningradskiy tekhnologicheskiy institut im. Lensoveta.
(Platinum compounds)

GRINBERG, A.A., akademik; GEL'FMAN, M.I.; IN'KOVA, Ye.N.; SHAGISULTANOVA, G.A.

Presence of exchange between irradiated metallic platinum and complex ions of divalent platinum in aqueous solutions. Dokl. AN SSSR 137 no.3:597-598 Mr '62.   (MIRA 14:2)

(Platinum—Isotopes)

GRINBERG, A.A., akademik; KUKUSHKIN, Yu.N.

Interaction between alkali and trans-$(Pten_2Cl_2)Cl_2$.
Dokl. AN SSSR 140 no.5:1076-1078 O '61.   (MIRA 15:2)

1. Radiyevyy institut im. V.G.Khlopina AN SSSR.
            (Platinum compounds)
            (Alkalies)

S/186/62/004/003/006/022
E071/E433

AUTHORS: Grinberg, A.A., Petrzhak, G.I., Lozhkina, G.S.

TITLE: Some new salts of uranyloxalic acid

PERIODICAL: Radiokhimiya, v.4, no.3, 1962, 289-295

TEXT: The authors investigated the synthesis of salts of uranyloxalic acid with complex cations. Initially it was attempted to obtain compounds with cations $[Co(NH_3)_6]^{3+}$ and $[Co(NH_3)_4(H_2O)_2]^{3+}$ and anion $[U(C_2O_4)_4]^{4-}$ by the double exchange reaction in a neutral medium. However, these compounds were not isolated, due to their rapid decomposition caused by the oxidizing-reducing interaction between the components of the complex formed. Subsequently the reaction between chromium-hexacarbamide chloride (III) and potassium uranyloxalate was tried. A new complex compound chromium hexacarbamide uraneate $[Cr(N_2H_4CO)_6]_4[U(C_2O_4)_4]_3 \cdot 11 H_2O$, in which the anion of uranyloxalic acid is bound to trivalent complex chromium cation, was synthesized. It was shown that this compound is stable in air and can be obtained either with an excess of $K_4[U(C_2O_4)_6]_4$ or of $[Cr(N_2H_4CO)_6]Cl_3$. The compound is little soluble in water (30 mg per litre) and

Card 1/2

Some new salts of ...

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diluted mineral acids.   On heating it is soluble in nitric (1:1), hydrochloric (1:1) and sulphuric (1:20) acids.   It is practically insoluble in ether, alcohol, benzene, carbon tetrachloride, isoamylacetate and isoamylalcohol.   The solubility was determined by synthesizing the compound labelled with uranium-233.   It was found that during dissolving in water a partial oxidation of $U^{(IV)}$ into $U^{(VI)}$ takes place.   There are 5 tables.

SUBMITTED: April 7, 1961

Card 2/2

GRINBERG, A.A.; IN'KOVA, Ye.N.; DOBROBORSKAYA, A.I.

Solubility of geometrical isomers of platinum complexes in
solutions of electrolytes. Zhur.neorg.khim. 7 no.5:987-991
My '62.   (MIRA 15:7)
                    (Platinum compounds)   (Solubility)

GRINBERG, A.A.; GEL'FMAN, M.I.

Interaction of complex compounds of the same metal in the same oxidation state. Zhur.neorg.khim. 7 no.5:992-996 My '62.

(Complex compounds)   (MIRA 15:7)

GRINBERG, A.A.; YUAN' KAN [Yuan K'ang]

Complex compounds of tetravalent platinum with glycol. Zhur. neorg. khim. 7 no.10:2304-2310 O '62.

(Platinum compounds)   (Ethylene glycol)   (MIRA 15:10)

GRINBERG, A.A.; SHAGISULTANOVA, G.A.

Instability constants of platinum complexes. Zhur.neorg.khim.
7 no.10:2311-2314 O '62.

(Platinum compounds)   (MIRA 15:10)

GRINBERG, A.A.; STETSENKO, A.I.

Acidic properties of cis- and trans-isomers of $[Pt(NH_2OH)_2(Py)_2]Cl_2$.
Zhur.neorg.khim. 7 no.12:2678-2684 D '62.   (MIRA 16:2)
          (Platinum compounds)   (Isomerization)

GRINBERG, A.A., akademik; KUZ'MINA, M.A.

Isotopic exchange of chlorine in Zeise's salt. Dokl.AN SSSR 144 no.4:798-801 Je '62.
(MIRA 15:5)
(Chlorine—Isotopes)   (Platinum compounds)

GRINBERG, A.A., akademik; KUKUSHKIN, Yu.N.

On the existence of ammoniated salts of quadrivalent platinum.
Dokl.AN SSSR 145 no.1:97-99 Jl '62.
(Platinum compounds)   (Amines)   (MIRA 15:7)